BUILDING HYBRID MULTICAST BY COMBINING IP AND APPLICATION LAYERS

Aleksandre Givi Lobzhanidze
Dr. Wenjun Zeng, Thesis Advisor

ABSTRACT

This work presents new multicasting algorithm called Hybrid Multicast (HM). HM is a software solution that implements the integration between ALM and IP Multicast. The proposed solution always tries to use IP Multicast capability wherever available; each computer on the hybrid network acts as an agent and is ready to extend the network to those nodes that do not have access to IP Multicast. In Hybrid Multicast, the path from Server to End-Node is built with minimum delay algorithm; HM assigns stability coefficient to each node, and based on bandwidth, delay, processing speed and loss rate, gives priority to those nodes that represent themselves more stable on the hybrid network. Unlike most existing multicast protocols that do not consider node failure in advance, HM adopts a proactive approach in which each node on the network has alternate parents which allow it to switch to backup route quickly and smoothly. HM also provides backup routes for IP Multicast enabled nodes. In addition, HM takes advantage of passive members, which are nodes that run hybrid multicast software, but have not joined any group yet.

Simulation results show that HM performs much better than other multicast protocols. HM distributes the data with smaller delay than ALM, and the recovery time for backup routes in HM is smaller than other multicast protocols. The advantage is generally more significant when the multicast group size is large.